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O2.302 Generic Properties of Plasma Sheath over Emissive Planar/Grooved Walls

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The plasma-wall interaction is a fundamental process determining the plasma parameters. The different types of sheathes over an planar/grooved emissive walls in electromagnetic fields of discharge plasmas are discussed in this paper. In kinetic simulations and in experiments, we found a plasma sheath rearrangement driven by a) an increase of the energy of electron beam bombarding the emissive wall, b) a nonuniformity of the surface due to erosion patterns or segments with the different secondary electron emission yields, or d) with a variation of magnetic field angle [1-3]. A new aspect of ion flux interaction with an emissive wall with Debye-scale erosion trenches in plasma at low gas pressure is discussed. A phenomena of ion current modulation along the grooved emissive surface with increasing the discharge voltage was studied in PIC MCC simulations for the experimental conditions [1,3]. Unexpectedly, after the transition between developed and collapsed sheaths over a front emissive surface, the ion flux directed inside erosion trenches was found considerably increasing.

1. Schweigert I V, et al 2015 Plasma Sources Sci. Technol. 24 025012
2. Schweigert I V, Keidar M, 2017 Plasma Sources Sci. Technol. 26 064001.
3. I. Schweigert et al 2018 Plasma Sources Sci. Technol. 27 045004 The authors gratefully acknowledge FA9550-11-1-0160,. One of authors, IS, was partly supported by RSF 17-19-01375.

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